Multicomponent Sensor K3R

Instruction manual

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Contents

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Functionality of the K3R sensors

The force sensor K3R110 is suitable for inspection tasks in quality assurance as well as in materials testing because of its compact design.
This precision force sensor is characterized by flat design of only 14 mm thickness up to 20 mm thickness.

The axial force Fz and the bending moments Mx and My are calculated from the strain gage signals of the 4 cantilever springs.

With the aid of a simple calibration matrix the forces and distances can be calculated as well.

Calibration Matrix for K3R Sensors

The sensors of the type K3R allow the measurement of the force Fz and the moments Mx and My.

The sensors K3R may be used for displaying 3 orthogonal forces Fx, Fy, and Fz, when the measured torques are divided by the lever arm z (distance of force application Fx, Fy of the origin of the coordinate system).

	ch1	ch2	ch3	ch4
Fz in N / mV/V	100,00	100,00	100,00	100,00
Mx in Nm / mV/V	0,00	-1,30	0,00	1,30
My in Nm / mV/V	1,30	0,00	-1,30	0,00
H	0,00	0,00	0,00	0,00

The force in the z direction is calculated by multiplying and summing the matrix elements of the first row A1J with the lines of the vector of the output signals uj

Fz = 100 N/mV/V u1 + 100 N/mV/V u2 + 100 N/mV/V u3 + 100 N/mV/V u4

Example: on all 6 measurement channels is u1 = u2 = u3 = u4 = 1.00 mV/V displayed. Then a force Fz results of 400 N.

The calibration matrix A of K3R sensor has the dimensions 4 x. 4
The vector u of the output signals of the measuring amplifier has the dimensions 4 x. 1
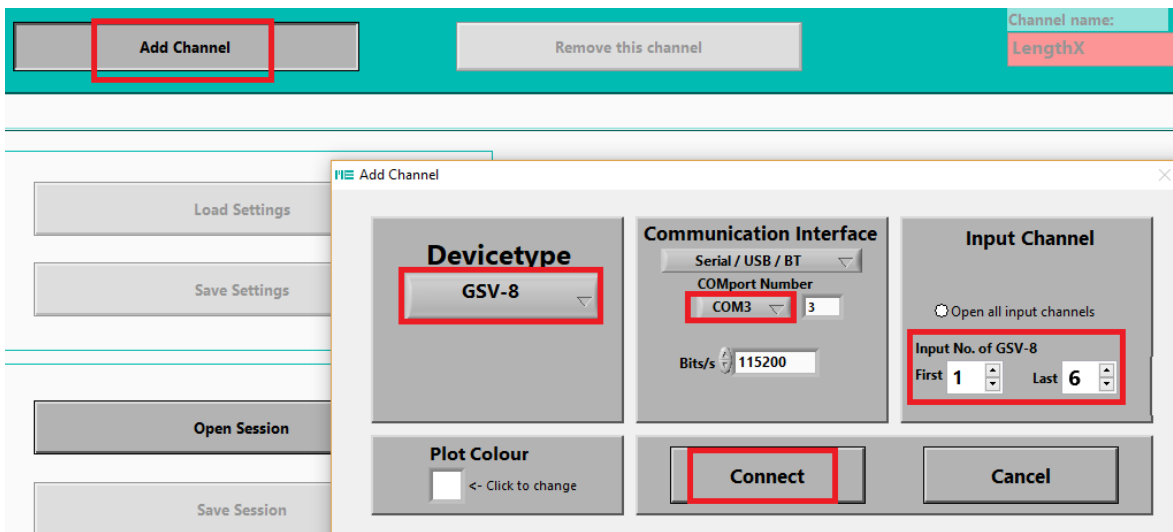The result vector (Fz, Mx, My, H) has the dimension of 4 x. 1
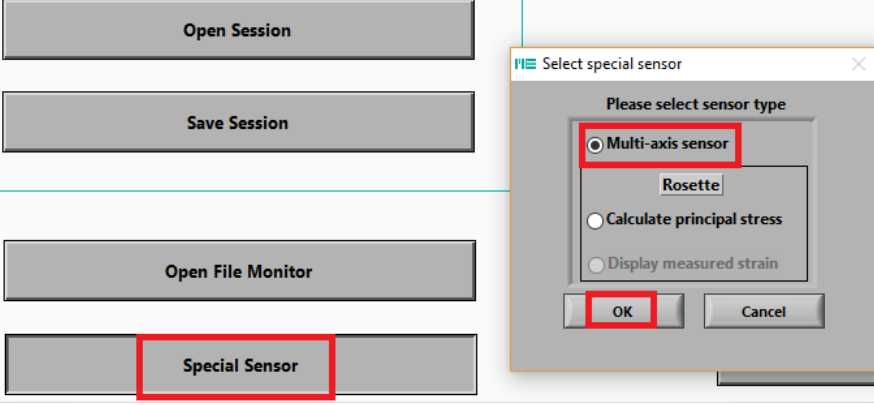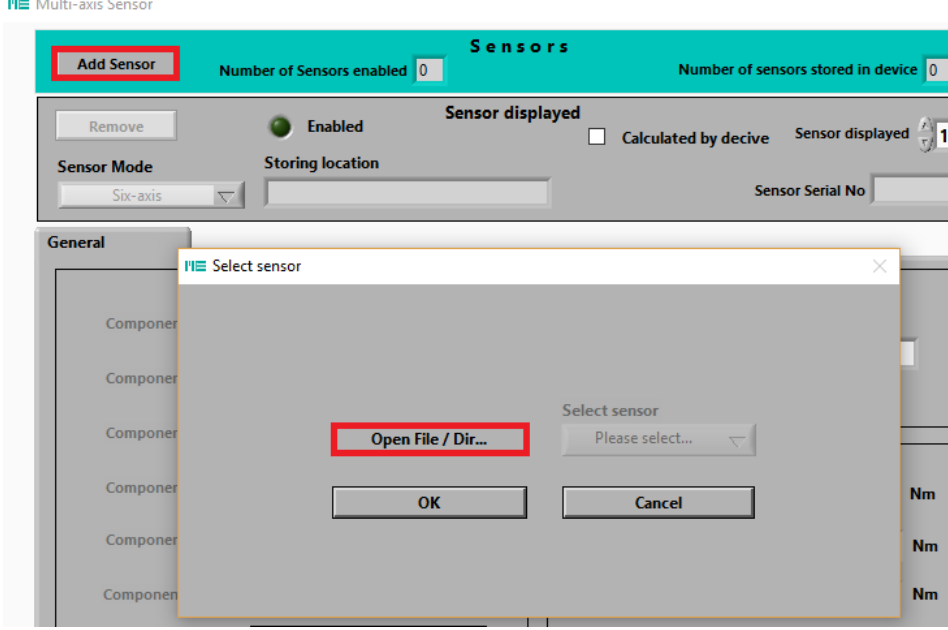At the outputs of ch1, ch2 and ch3 after applying the calibration matrix, the force Fz and the moments Mx and My are displayed. On the Channel 4 output H is constantly displayed 0V by the fourth line.

Commissioning of the sensor

The "GSVmulti" software is used to show the measured forces and moments. The GSVmulti software and related manuals can be downloaded from the website here.

Step	Description
1	Install the Software GSVmulti
2	Connect the GSV-8DS measurement amplifier via the USB port; Connect the K3R sensor with the measurement amplifier. Note: use only the socket 1/6! For multi-pin connectors with seal, the union nut or the locker is stiff. Alternatively press the connector and tighten the union nut/lock. Switch on the measuring amplifier.
3	Copy directory with calibration matrix (supplied with USB-stick) on appropriate drive and appropriate path.
4	Start the Software GSVmulti
5	Main window: Button AddChannel; Select Device type: GSV-8 Select COMport Number: e. g. COM3; please find the proper COM-port in device manager, or when installing the driver on the appropriate system message Windows Input Channel: select Channels 1 to 6 Button Connect
6	Main window: Button Special Sensor Select Multi-axis sensor

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Step	Description
7	Window „Multi-axis sensor settings: Button Add Sensor a) Button Open File/Dir select the directory with the file Serial number.dat. This file contains e. g. Measuring ranges of the sensor and cross-references to the file with calibration matrix (.matrix) b) Button OK
8	c) Button Auto Rename Channels d) if necessary, select the displacement of the force application point e) Button OK

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Step	Description
10	Select Window „Recorder Yt", start measuring;

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Changelog

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